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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,892	06/04/2001	Ivan Jesus Fernandez Corbaton	010224	5143

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QUALCOMM, INC  
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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT PAPER NUMBER

2631

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/873,892

Applicant(s)

CORBATON ET AL.

Examiner

Kevin M. Burd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-10 and 27-29 is/are allowed.
- 6) ☒ Claim(s) 1-7, 11-26 and 30-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. This office action, in response to the amendment filed 8/12/2005, is a final office action.

### ***Response to Arguments***

2. Applicant's arguments filed 8/12/2005 have been fully considered but they are not persuasive.

Applicant states Rafie et al (US 6,628,707) does not disclose estimating a signal to interference ratio (SINR) of a wireless channel. The examiner disagrees. Rafie discloses estimating the SNR at the output of the equalizer. This is one of the channel performance characteristics used to adapt the equalizer (column 11, lines 60-65).

The Applicant states Rafie does not disclose determining a parameter using said output because according to the office action the parameter is the output. However, the parameter is the fed back portion of the equalizer output used to estimate the SNR of the channel. This is shown in figure 5. Line 522 is the output of the system. The equalizer 503 sends a feed back signal 551 to the equalizer weight block 512. The signal 551 is the parameter.

Applicant states Rafie does not disclose estimating the SINR of the wireless channel using said parameter. The examiner disagrees. Rafie estimates the SNR at the output of the equalizer as stated before.

Applicant states Rafie does not disclose applying an adaptive equalizer to the pilot portion of a current frame, wherein said adaptive equalizer was adapted during a

previous frame. The Examiner disagrees. Figure 5 shows a feedback system.

Therefore, the equalizer is adapted according to information from a previous frame.

The dependent claims are rejected for the reasons stated above and in the previous office action.

Claims 8-10 and 27-29 are allowed

This action is made final

A new drawing objection is made and stated below.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed features of claims 20-37 must be shown or the features canceled from the claims. No figures showing the details of the apparatus or system are found in the instant application. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

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consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 14, 15, 20-22 and 30-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Rafie et al (US 6,628,707).

Regarding claims 1, 2, 14, 20, 21, 30 and 31, Rafie discloses the adaptive equalizer system and method of using the equalizer as shown in figure 5. The adaptation algorithm for the equalizers of figure 5 is based on the estimated SNR at the output of the equalizer (column 11, lines 48-63). The channel comprises pilot and non-pilot components (column 9, lines 27-48). The carrier phase synchronization system 200 of figure 2 uses the inserted pilot symbols and the estimated data symbols to

accurately recover the carrier phase offset for the short bursts (column 9, lines 45-48). Therefore, the pilot symbols are used to adapt the equalizer (column 14, lines 44-51). The equalizer is applied to the inputted signal, which comprises pilot and data symbols and generates a parameter, the parameter being an equalized output signal shown in figure 5. This signal is used to estimate the SNR of the channel.

Regarding claims 3, 15, 22 and 32, the equalizer uses a mean square error algorithm (column 5, lines 27-28).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 11-13, 16, 23 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rafie et al (US 6,628,707) in view of Strodbeck et al (US 6,680,985).

Regarding claim 4, 11-13, 16, 23 and 33, Rafie discloses an apparatus and method as stated above in paragraph 3. Rafie does not disclose calculating a bias to estimate the SNR of the wireless channel. Strodbeck discloses using a bias to adapt the equalizer shown in figure 1 (column 2, line 63 to column 3, line 3). This adaptation correctly sets a voltage bias (column 3, lines 18-30). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate Strodbeck's method of using a bias eliminate errors and thereby increase the SNR in the apparatus and

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method of Rafie. The adaptation will be accomplished sooner if the errors are eliminated.

6. Claims 5, 6, 24, 25, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rafie et al (US 6,628,707) in view of Wells et al (US 6,310,915).

Regarding claims 5, 24 and 34, Rafie discloses an apparatus and method as stated above in paragraph 3. Rafie does not disclose decoding and re-encoding the received data prior to estimating the SNR. Wells states it is desired to re-encode a previously encoded signal. For example, it is desirable to re-encode the signal in a fashion other than it was originally encoded to meet network congestion/bandwidth availability constraints to provide the signal to different users with varying decoder capability (column 3, lines 41-47). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the decoding and re-encoding of Wells into the method and apparatus of Rafie for the reasons stated above.

Regarding claims 6, 25 and 35, Rafie discloses the equalizer uses a mean square error algorithm (column 5, lines 27-28).

7. Claims 7, 26 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rafie et al (US 6,628,707) in view of Wells et al (US 6,310,915) further in view of Strodtbeck et al (US 6,680,985).

Regarding claims 7, 26 and 36, the combination of Rafie and Wells discloses a method and apparatus stated above in paragraph 5. The combination does not disclose

calculating a bias to estimate the SNR of the wireless channel. Strodtbeck discloses using a bias to adapt the equalizer shown in figure 1 (column 2, line 63 to column 3, line 3). This adaptation correctly sets a voltage bias (column 3, lines 18-30). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate Strodtbeck's method of using a bias eliminate errors and thereby increase the SNR in the apparatus and method of the combination of Rafie and Wells. The adaptation will be accomplished sooner if the errors are eliminated.

8. Claims 17, 18 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rafie et al (US 6,628,707) in view of Marchetto et al (US 5,914,959).

Regarding claims 17, 18 and 37, Rafie discloses the adaptive equalizer system shown in figure 5. The adaptation algorithm for the equalizers of figure 5 is based on the estimated SNR at the output of the equalizer (column 11, lines 48-63). The channel comprises pilot and non-pilot components (column 9, lines 27-48). The carrier phase synchronization system 200 of figure 2 uses the inserted pilot symbols and the estimated data symbols to accurately recover the carrier phase offset for the short bursts (column 9, lines 45-48). Therefore, the pilot symbols are used to adapt the equalizer (column 14, lines 44-51). The equalizer is applied to the inputted signal, which comprises pilot and data symbols and generates a parameter, the parameter being an equalized output signal shown in figure 5. This signal is used to estimate the SNR of the channel. Rafie does not disclose selecting the rate for the transmission of data using the SNR. Marchetto discloses a scheme that reduces the data transmission rate as the



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SNR becomes poor. This ensures that the BER remains high (column 1, lines 46-47).

For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the selection of the transmission rate using the SNR of Marchetto into the apparatus and method of Rafie.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rafie et al (US 6,628,707) in view of Marchetto et al (US 5,914,959) further in view of Strodtbeck et al (US 6,680,985).

Regarding claim 19, the combination of Rafie and Marchetto discloses the apparatus and method stated above in paragraph 7. The combination does not disclose calculating a bias to estimate the SNR of the wireless channel. Strodtbeck discloses using a bias to adapt the equalizer shown in figure 1 (column 2, line 63 to column 3, line 3). This adaptation correctly sets a voltage bias (column 3, lines 18-30). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate Strodtbeck's method of using a bias eliminate errors and thereby increase the SNR in the apparatus and method of the combination of Rafie and Marchetto. The adaptation will be accomplished sooner if the errors are eliminated.

***Allowable Subject Matter***

Claims 8-10 and 27-29 are allowed.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin M. Burd  
10/17/2005

  
**KEVIN BURD**  
**PRIMARY EXAMINER**